Request for Information (RFI): Digital Object Storage and Retrieval (DOSR) SN08-33

The vision of a digital system that makes information readily available to an individual has evolved from Vannevar Bush's Memex concept to the revolutionary realities of the World Wide Web and millions of smaller digital collections. Today, search engines can recall thousands of potentially relevant documents in milliseconds from digital storehouses that swell by petabytes each year. Preserving, securing, analyzing, and accessing the contents of this digital ocean is essential to national security, commerce, and daily life. Current systems are divided into those that provide a query or aggregation layer on top of variably restricted and implemented systems, and those that serve the specialized needs of an enterprise, group, or individual. Major challenges still exist in creating systems that can secure, organize, characterize, search, and distribute digital information, in its many encapsulations, across a unified framework. In many ways, the management of digital information is still where computer systems were before the invention of internetworking.

For military organizations, secure access to resilient, reliable information is absolutely essential as it can be, literally, a matter of life and death. Military operations involve a multitude of networks and systems operating under various degrees of duress, with a wide variety of information needs, objectives, and constraints.

In order to further explore these areas, the Defense Advanced Research Projects Agency's (DARPA) Information Processing Techniques Office (IPTO) invites participation in this RFI from all those engaged in related research activities. In addition, a DARPA-sponsored workshop has been planned for 15-16 July 2008 in Northern Virginia, for the purpose of reviewing on-going research in the implementation of distributed, resilient, and secure, digital object storage and retrieval (including analysis, query, and dissemination). Information presented at the DOSR workshop will contribute to the formulation of future areas of DARPA research, such as creating a prototype system capable of experimental deployment in an incompletely trusted network. Authors may be invited to present related work and on-going research activities associated with digital object storage and retrieval including:

- Secure, survivable, storage networks
- Object persistence by fragmentation, coding, and replication
- Automated metadata extraction from unstructured and semi-structured information
- Location and replication of objects near likely users by means of adaptive user models
- Personalization of content
- Targeting of information to specific groups and individuals based on interests, objectives, authorization, and constraints
- Secure peer-to-peer distribution of information
- Scalable, distributed digital security
- Scalable, secure, federated search
- Search of encrypted indexes
- Information consistency maintenance in distributed, replicated, storage networks

- Decentralized, secure, self-configuring routing
- Resolution of object identifiers into the address(es) of the most available copy.
- Reliable, persistent identification of unique digital objects and variants
- Secure and shareable versioned objects
- Provenance and tracking of objects

PLEASE NOTE THAT SPACE FOR THE WORKSHOP IS LIMITED AND ATTENDANCE WILL BE BY INVITATION ONLY. Invitations will be based on white papers submitted by the candidate authors, per the instructions below, no later than 1200 (Noon) ET, 23 May 2008. These white papers should briefly summarize approaches, and not exceed 5 pages, including figures. Accepted authors will be notified via email by 15 June 2008 and will be invited to provide a 15 minute unclassified, non-proprietary presentation, with five minutes for questions. No expenses will be paid to the participants.

INSTRUCTIONS TO RESPONDENTS

DARPA appreciates responses from all capable and qualified sources, including but not limited to, universities, university affiliated research centers, federally-funded research centers, private or public companies, and Government research laboratories. DARPA will employ an electronic upload system for responses to this RFI. To respond to the DOSR RFI, interested parties must complete an online cover sheet for each white paper response, which will include the information outlined below. To do so, candidate authors must go to https://csc-ballston.com/rfi/rfiindex.asp?RFIid=08-33 and follow the instructions there.

Upon completion of the online cover sheet, a confirmation screen will appear, along with instructions on uploading the white paper. All white paper submissions must be formatted in either Microsoft Word or Adobe PDF.

Since candidate authors may encounter heavy traffic on the web server, they SHOULD NOT wait until the day submissions are due to fill out a coversheet and submit the white paper!

DARPA will acknowledge receipt of submissions via email.

White papers should adhere to the following formatting and outline instructions:

1. Page format specifications include: 12 point font, single spaced, single-sided, 8.5 by 11 inches paper, with 1-inch margins. All white papers must be written in English. All submissions must be formatted in either Microsoft Word or Adobe PDF. NO PROPRIETARY OR CLASSIFIED INFORMATION SHOULD BE INCLUDED IN THE RFI RESPONSE.
2. Cover Page (1 page)
    a. Title;
    b. Organization;
    c. Responder's technical and administrative points of contact (names, addresses, phones and fax numbers, and email addresses);

    d. Topic area(s) addressed (chosen from bulleted list above); and
    e. Indication of willingness to attend the Workshop.
3. Technical Ideas (up to 5 pages)
    a. Executive summary;
    b. A discussion of the capability/challenge addressed (from your perspective);
    c. Technical Response - Your discussion should address the following: What is your proposed innovative technology/concept? How does it address the specific capability/challenge in Distributed Object Storage and Retrieval? What is the current capability versus the desired capability? What extensions or advances are needed to achieve the Distributed Object Storage and Retrieval vision?; and
    d. Brief summary of any relevant experience in Distributed Object Storage and Retrieval implementations.
4. An optional list of citations, including URLs, if available. (1 page)

Candidate authors are encouraged to be as succinct as possible while at the same time providing insight.

DISCLAIMERS AND IMPORTANT NOTES

This is an RFI issued solely for information and possible new program planning purposes; the RFI and workshop do not constitute a formal solicitation for proposals or abstracts. In accordance with FAR 15.201(e), responses to this notice are not offers and cannot be accepted by the Government to form a binding contract. Submission of a white paper, and/or attendance at the workshop, is voluntary and is not required to propose to subsequent Broad Agency Announcements (if any) or research solicitations (if any) on this topic. DARPA will not provide reimbursement for costs incurred in responding to this RFI or participating in the RFI workshop. NO PROPRIETARY OR CLASSIFIED INFORMATION SHOULD BE INCLUDED IN THE RFI RESPONSE. Candidate authors are advised that DARPA is under no obligation to provide feedback to candidate authors with respect to any information submitted under this RFI.

Submissions may be reviewed by: the Government (DARPA and partners); Federally Funded R&D Centers (such as MIT Lincoln Laboratory); and Systems Engineering and Technical Assistance (SETA) contractors (such as Schafer Corporation, Science and Technology Associates, CACI International, and System Analysis, Inc.).

POINT OF CONTACT

Dr. Joshua Alspector, IPTO Program Manager, DARPA, Email SN08-33@darpa.mil. ANY INQUIRIES ON THIS RFI AND/OR WORKSHOP MUST BE SUBMITTED TO SN08-33@darpa.mil. NO TELEPHONE INQUIRIES WILL BE ACCEPTED.